THERMAL BARRIER COATINGS, COMPONENTS, METHOD AND APPARATUS FOR DETERMINING PAST-SERVICE CONDITIONS AND REMAINING LIFE THEREOF

Abstract of Disclosure

A method for determining past-service conditions and/or remaining useful life of a component of a combustion engine and/or a thermal barrier coating ("TBC") of the component comprises providing a photoluminescent ("PL") material in the TBC, directing an exciting radiation at the TBC, measuring the intensity of a characteristic peak in the emission spectrum of the PL material, and correlating the intensity of the characteristic peak or another quantity derived therefrom to an amount of a new phase that has been formed as a result of the exposure of the component to extreme temperatures. An apparatus for carrying out the method comprises a radiation source that provides the exciting radiation to the TBC, a radiation detector for detecting radiation emitted by the PL material, and means for relating a characteristic of the emission spectrum of the PL material to the amount of the new phase in the TBC, thereby inferring the past-service conditions or the remaining useful life of the component.

Figures